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approach

APRIL 1973 THE NAVAL AVIATION SAFETY REVIEW

Take a routine night approach to Homefield, add some unreported bad weather, and mix in a little cockpit confusion and some screwed-up communications. Result: a short order . . .

Nightmare

A TA-4 instructor and student were planning their return from a weekend cross-country early on Sunday evening. The flight was an easy one-point-five back to Homebase. Weather offered no enroute problems, and the forecast for NAS Homebase was typical late summer: 3500 scattered, 25,000 broken, 5 miles in haze, rainshowers and thunderstorms in the vicinity. The syllabus called for the student to fly front seat and terminate with an instrument approach plus some VFR night landings if possible.

It was quiet at FL 310 for Navy 2345, with good vis and very little traffic. Twenty minutes from the IAF, the student attempted to contact NAS Metro. No joy. He finally raised an AFB Metro 60 miles away that reported NAS to be 7000 broken, 25,000 scattered, 5-6 miles vis, with no change expected for the next hour. When asked for a PIREP, the TA-4 reported a slight haze layer, but nothing significant.

It was common practice on Sunday nights for returning cross-countries to request a TACAN approach with a missed approach and GCA pickup followed by VFR touch-and-gos, traffic and weather permitting. After acknowledging Navy 345's request for a TACAN 18 approach, Center cleared the *Skyhawk* to 15,000 feet. Thereafter – apparently not understanding the penetration request – Center cleared the aircraft to 8000 feet at pilot's discretion. The pilots repeated their request. They needed the TACAN penetration to fulfill syllabus requirements.

After handoff to approach control, Navy 345 was cleared for the TACAN approach and was given a new altimeter setting. The student completed the penetration checklist, noting 1000 lbs of fuel above landing weight. He reported leaving 15,000 and commencing approach and received a new altimeter setting. The pilot was told to report the final approach fix with gear.

As 345 turned from the arc onto final approach course, the tower (which had been monitoring approach control) was discussing the *2-mile* visibility and the intensity of the *"heavy, heavy rain"* with the duty forecaster. Passing 1600 feet, the student reported the final approach fix with gear. Tower cleared them for a low approach, requesting they report missed approach. Tower asked if they had the field in sight, and 345 replied, "Affirmative" (meaning they had the approach lights, not the runway or the ball).

Meanwhile, on the landline, Approach asked Tower:

"Why'd you clear him for a low approach?"

"That's what he wanted, wasn't it?"

"Not that I know of . . . He was cleared for a penetration and approach."

Just prior to this exchange, the NAS ODO, who had

been checking the weather radar, noted an area of precipitation from 5 miles east to 10 miles southeast, pushed by a southeast surface wind. Knowing a TA-4 was inbound, the ODO went to RATCC. On learning of 345's intentions for a low approach/missed approach/GCA, he called the tower on intercom and instructed them to advise the pilots of the rainshowers and to recommend a full stop. This call coincided with the discussion between Tower and Approach on just what 345 wanted.

Meanwhile, the student pilot was late in commencing his landing checklist. They were at or near MDA (minimum descent altitude), 350 feet AGL, when an inadvertent transmission was heard:

"... have spoilers ... (garble) ... my harness is locked, hook is up, gear and flaps ... "

"You're cleared to land, cleared to land runway 18." The tower controller was responding to the ODO's instructions by encouraging a full stop, but without mentioning either the deteriorating visibility or the rain.

Twenty seconds later, assuming their intentions were again misunderstood, the instructor transmitted:

"Approach, 345, we'll be requesting a missed approach to runway 18."

To the pilots, the only real problem seemed to be making Approach and Tower understand that this training flight could only be completed with a GCA and some touch-and-gos.

The student had not completed his checklist until past the approach fix. But the approach lights could be seen, and the pilots had no reason to believe they were not VFR. No doubt they were looking for the runway, and no doubt they were asking each other about runway or ball acquisition. The area around the approach path is largely uninhabited and notoriously black at night.

Tower answered the request for a missed approach by saying, "Are you sure you want a low approach with this rain coming in like this? Go ahead and full-stop if you like. It's getting pretty bad."

Thus, less than a minute from the threshold, the pilots were given a late weather warning which required an instantaneous decision, i.e., wave off into possible severe weather, or land a *heavy Skyhawk* on a wet runway, which was not yet visible. There was no time to ask for further details. They had to find the runway if they were going to use it. They were actually IFR, but still believed the field to be VFR. Several seconds after the tower's "rain" transmission, 345 replied:

"Uh, 345, we'll take a full stop."

"Roger, cleared to land."

"I got it," 345 transmitted unintentionally 12 seconds later.

The next transmission received by the tower was from the field.

"Tower, Crash Truck 14, we've got a crash on the North. We're rolling."

The crashcrew was moving 5 seconds after impact.

The crash circuit was activated. The duty forecaster made his crash circuit observation: "1000 scattered, estimated 7000 broken, 25,000 over, 2 miles in rainshowers, wind 140 at 4 gusting to 13. Reason for the observation: TA-4 has flown into the trees 1 mile short of the duty."

The aircraft impacted slightly right of the extended centerline and slid over 200 feet through "moderately dense forest" shedding landing gear and airframe parts all the way. Fuel was strewn throughout the impact area and ignited. The left wing was severed between the wing droptank and the fuselage.

On investigation, both altimeters were found with the last setting given. Both read -30 feet . . . most likely due to a static line being crushed on impact giving a decrease in indicated altitude. The radar altimeter had been secured due to a malfunction. Full power had been added prior to impact, and the fuel control was set at military. No engine malfunction was indicated. Both pilots had been trained and were properly qualified. No material factor, no supervisory factor, no NATOPS factor. Evidently, the causal factors rested with the pilots. Speculation need go no further, however, because the ambulance crew, arriving at the edge of the trees for their grim task, were met by two sober, slightly-burned pilots, walking out of the woods.

With no specifics as to extent or intensity of the rain and feeling they were still VFR with the runway environment in sight, the *Skyhawk* pilots felt it imperative that they acquire a ball and get on deck – taking the A-gear if necessary. An overweight aircraft on a wet runway at night with an inexperienced man in the front seat is a rough combination. Being on final with only seconds to touchdown and still looking for the ball, you realize your predicament is spelled S-T-R-E-S-S. Rapidly closing the runway, both pilots were looking for either the ball or the runway lights when the instructor said, "I got it," meaning he had the runway in sight. The instructor looked back into the cockpit, saw the angle-of-attack passing 20 units, and called for "Power!"

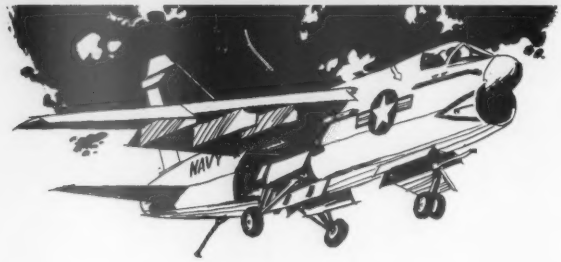
Both pilots saw the tree line as a shadow between them and the approach lights. *Both knew they were dead.* They felt contact with the trees, followed by a feeling "like a violent trap." Realizing they were still alive, each pilot pulled his alternate ejection handle. Neither seat fired because the gas lines had been severed on impact. Neither pilot questioned the absence of the canopy, although neither had jettisoned it.

The right side of the instructor's flight suit was aflame. Pulling his harness release handle, he stood up and dove head-first over the right side. Still on fire, he rolled on the ground until the fire was out. The student caught fire while exiting the aircraft. He also rolled on the ground to put out the fire. As the two moved away from the burning wreckage toward lights near the edge of the forest, the instructor broke out his PRC-63 and called the tower. They met a very surprised crashcrew.

Sure, the pilots were "set up" by the communication foul-ups and bum dope on the weather, but if you don't brief crew coordination and make some "who does what, when" decisions ahead of time, it's like the poet says:

"Of all sad words of tongue and pen, the saddest these: 'It might have been.' "

AIR BREAKS



Watch the Wash. *Hueys, Sea Knights,* and *Sea Stallions* frequently engage in section approaches and landings. In this tactical maneuvering, they are either involved in training flights or the real McCoy, inserting or extracting troops.

A recent mishap occurred when No. 2 in a section of *Hueys*, on the fourth approach to a prepared LZ (landing zone), encountered turbulence from lead. The aircraft developed a sharp sink rate, and despite all attempts by the pilot to wave off, the helicopter impacted the ground hard, spreading the skids and crosstube assemblies.

Environmental conditions also worked against the pilot. On the fourth approach, the pilot lagged a *skosh* behind lead, on the downwind side. When he realized he was out of position, he began his waveoff just as he entered lead's blade vortices. Wind direction and zone restrictions were working against him. He had neither the altitude nor the airspace within which to execute a waveoff.

The UH-1 NATOPS Manual describes power settling as "the inability to maintain level flight or stop a rate of descent when the helicopter begins to settle into a disturbed air mass." Why? The manual further explains that the decreased rotor efficiency resulting from recirculated air through the rotor system causes a loss of lift, increased roughness, and poor control response.

NATOPS does not address the problem of section approaches and landings. Nor does it mention intervals, distances, or words of caution concerning rotor blade vortices.

Looks like squadron SOP will have to dictate the procedures to be used and the parameters to follow.

APPROACH would certainly look with favor on an article covering the subject.

Gottinhimmelsprucken. The EC-121K eased into its parking spot so smoothly that those aft didn't realize motion had ceased. The first indication that the aircraft was chocked and that the flight had ended was the silence when the engines were secured.

The pilots (both aircraft commanders), busy in the cockpit completing the long secure checklist, acknowledged signals from the line crew that the aircraft was chocked, gear pinned, and external power hooked up. The pilot in the left seat, not the aircraft commander for the flight, then released the parking brake and both pilots continued the checklist.

A minute or two later, a slight thump was felt, as if the aircraft had moved. It had. Chocked with only one chock on a slight incline, the EC-121K had rolled over the chock and collided with an NC-8 about 20 feet away. (Now it was "chocked" real good.)

The line crew and one of the flight crewmen elected to chock the big *Connie* with only one chock. To make matters worse, the one chock used was not authorized for the EC-121. (The ground accident report didn't say what type it was.) NATOPS states the parking brake may be released – and usually is – after certain criteria are met. The pilot did not ensure that the aircraft was properly chocked, nor did he notice the degree of incline prior to releasing the parking brake. "Obviously," the report said, "this ground accident

was due to complacency."

We'd better point out that it was night, the pilots' windows were closed because of an agricultural inspection, and the *Connie* was being parked in an area convenient for the agriculture/customs inspection.

Plans were to tow or taxi the aircraft to another parking area after the inspection.

Let's look at a step-by-step summary of events, any one of which could have prevented the ground accident.

- The ground crew didn't follow procedures by using only one chock, even though the parking spot was temporary.
- The crewman from the aircraft, who was on the line, didn't advise the pilot there was a slope.
- The pilots didn't stick their heads out of the bird and sight chocks in place.
- Releasing the parking brake, even though the parking spot was an interim one, was probably habit.
- Lack of communications between those in the aircraft and those on the ramp was apparent.

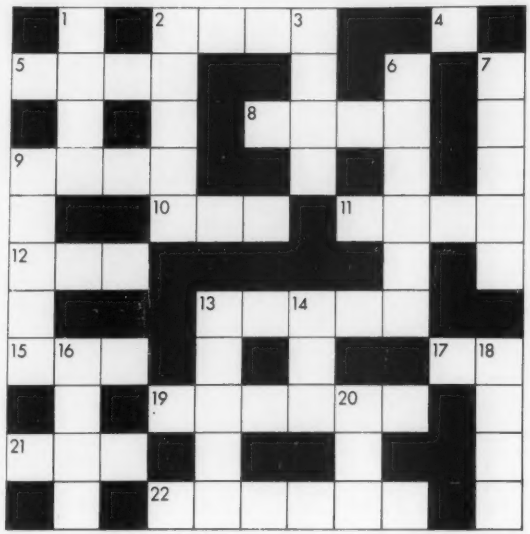
Call the cause of this ground accident what you wish. Complacency? Yes. Not following procedures? Yes. Shortcutting? Yes. Poor judgment? Yes – all of which may be summed up as . . . Delta Sierra!

P-3 Pitchup. Within the P-3 community, there have been several occasions when pitchup has injured one or more crewmen. On each occasion, with the autopilot and BAR hold ON, a sudden, violent pitchup has been experienced, and crewmen have suffered injuries when the pilot disengaged and nosed over too quickly.

One recent occurrence caused a triple whammy to a crewman. The P-3 was tooling along at FL 260 when a pitchup occurred. The crewman was driven to his knees initially, then as the pilot quickly nosed over, he was bounced off the overhead, then slammed to the deck. He had been forced to defy gravity along with toolboxes and everything else not tied down.

The crewman complained of dizziness, aches and pains, and seemed to be in a state of shock. He was treated for shock while the plane commander returned him to Homeplate for medical attention.

The squadron recommended that pilots of P-3s consider appropriate power changes for pitchups/downs, followed by smooth, unusual attitude recoveries.



Across

2. Caused by excessive rudder
4. Unit of acceleration measurement
5. Vertical to relative wind
8. Makes angle-of-attack greater at wingtip
9. Prevents escape of fluids
10. Downwind side of mountain
11. Reserve supply is proper
12. Rearward
13. Tube in airspeed system
15. Trimming device
17. Must be kept within limits
19. Fin on back of aircraft
21. Stabilizer
22. Ratio of wing span to mean chord

Down

1. Usually necessary to exceed red line
2. Occurs when angle-of-attack exceeds angle-of-maximum-lift
3. Increases as angle-of-attack increases
6. Forward directing force
7. Dihedral
9. Opposite of shutdown
13. Small airfoils
14. Abbreviation of airspeed when entirely corrected
16. Vertical, longitudinal, or lateral
18. A sudden and brief change of wind velocity
20. Traffic management

See page 31 for crossword puzzle answers.

Some thoughts on aviation safety by a Weekend Warrior who, in his civilian capacity, is an aviation consultant to the State of Florida. He advises you to

KEEP A FEW ACES UP YOUR SLEEVE

By Robert E. Babis

ACCIDENT brief: N1234B, Cessna 310 – Pilot had unsafe nose-gear indication. Nosegear still unsafe after complying with cockpit emergency procedures. Requested a low pass by tower for visual inspection. Was informed that nosegear was swinging freely. Pilot elected to land on runway 31, Craig Field, and requested that emergency equipment be standing by. Aircraft landed and nosegear collapsed on slow rollout. Minor damages, no injury.

Analyst's comments: We give this lad an above average for headwork. When he recognized the problem, he took time to think about it, and had the good sense to seek assistance outside the cockpit.

When flying, incidents will often occur over which you have no control. The above item is a good example. What could possibly have been a serious accident with injuries was avoided because of the pilot's positive action and his putting every possible factor in his favor. Success stories like these don't just happen. They are the result of good planning and a basic flying philosophy which incorporate the use of everything available.

Let's take the above incident again and back up a couple of hours. Say the pilot had taken off from New Orleans and arrived at Jacksonville with about 35 to 40 minutes of fuel remaining. Mix in darkness and marginal visibility. Oh, yes, he had also "boomed it" in New Orleans the night before. The same incident, but the probable outcome is less certain. Why?

Poor weather and short fuel supply tend to make actions more urgent. The pilot's options are reduced. Time to consult with other airborne aircraft, or to divert, is diminished. In effect, once your options are gone, you have lost control of that flight, and successful completion becomes less certain. This realm of uncertainty is the beginning of unsafe flight.

As we gain experience (the longer we survive), we find there are fewer "either/or" situations. Most things offer a choice somewhere between extremes from which we can select. Aviation can be placed on such a spectrum between the extremes of safe and unsafe. Not only does the distance between those two extremes vary, but the point of an unsafe condition varies. Just where a

flight becomes unsafe along this spectrum depends on the factors involved. With me, it varies from day to day. In fact, it varies for each flight, and it may change during the flight. For each mission, there are a set of circumstances that describe safe flight. The exact point where the mission or flight becomes unsafe is largely dependent on things that the pilot controls. For example:

Pilot – good physical condition, well-rested, an absence of hunger, hangover, and hangups.

Aircraft – Servicing personally checked, minor discrepancies noted, major discrepancies corrected.

Environment – Weather checked, lighting and obstructions noted, and an "out route" planned.

Management – Alternate courses of action planned. Always have at least two places to go.

A friend of mine, a Pan-American pilot and a fellow Naval Air Reservist, summed it up when he said, "Aviation safety is *not* playing your aces early." He's right. Search out the options in planning and expand your alternatives. The beautiful thing about this flying business is that most of the time you're able to stack the deck in your favor.

None of us can afford to ignore facts and conditions which diminish the certainty of successfully completing a flight. Summing up, the margin of safety is yours to control. The aviation spectrum of safety is a variable, with size a function of controllable factors. Be positive, be aggressive, have a few options, and . . . keep a few aces up your sleeve. ◄

A viable safety program must involve all hands. One innovative way of doing this is VA-164's designation of a

Safety Observer

By LCDR Charles E. Laskey

ALMOST daily for an entire cruise, my squadron managed to appear on the ship's daily safety violation sheet. In general, the violations concerned ordnance procedures or bomb-rack security. A constant effort was expended to eliminate reported violations. Upon returning to CONUS, I decided to continue a safety observer program in the squadron. Maybe the violations that occurred aboard ship were unique to an embarked squadron, or perhaps they existed prior to deployment and were not corrected.

Being the squadron ASO, I couldn't afford the time to constantly observe every squadron evolution. Thus, my first task was to select a safety observer. I needed an experienced, conscientious, and dedicated individual. I didn't intend for this to be a full-time job, but needed someone who could spare enough time to make the program beneficial. An obvious selection in the squadron was our aircraft division chief. He accepted the task with such enthusiasm and professionalism that the program showed immediate results.

His first measure was to publish a memo to the maintenance department delineating his intentions. "It is my intention to observe, correct, and report all safety violations to responsible personnel and to provide an environment of maximum safety for *all hands*."

He initiated a safety log that noted all sighted violations and discussed such violations with the individuals concerned and their supervisors. His log was closely monitored by the ASO, the maintenance officer, and the commanding officer. Twice a month, he published a list of observed violations and distributed it to all hands. The results were eye opening!

First of all, we found that our safety problems were not unique to the ship. Similar violations occurred ashore, indicating a poor attitude and a lack of proper training and supervision. Also, 95 percent of all violations could have been prevented had NATOPS or appropriate MIMs been followed or had good common sense and proper supervision been applied.

Approximately 50 violations were recorded during the first 2 weeks. Half of them could have resulted in personnel injury. The second report noted a 35 percent decrease in violations and stated: "It is readily apparent that many more people are aware of and are participating in our efforts to decrease safety violations." Aha!! A safety officer's dream come true – *people actively participating in a safety program.*

The program continues to show results. Although we have not attained our goal of "zero violations," indications are that we are making significant progress. The latest report shows a 78 percent decrease in observed violations. Violations of a repetitive nature are beginning to disappear. The introduction of a squadron safety observer has proven to be a valuable asset in our continuing efforts to maintain a safe and professional outfit. ◄

The Additional Burdens of Command Responsibility on a Mercy Mission!

WHAT do the Caribbean Islands, the Gulf Coast, the Eastern seaboard, and the Pacific Islands have in common? Well, for one thing, they have all been damaged by hurricanes or typhoons, and the residents of these areas are indebted to helicopter crews who have provided poststorm relief. One other common item these farflung geographical areas may have, in the aftermath of these disasters, is damaged helicopters.

It's an odds-on bet that after a natural disaster, helicopter rescue crews working the area will have a major accident. There are several reasons:

- Pilots operate at low levels where exposure to collisions with obstacles is great.
- Pilots operate in unfamiliar areas where landing zones leave much to be desired.
- Pilots will accept aircraft with marginal discrepancies to get the job done.
- Maintenance of aircraft frequently is delayed or is nonexistent due to the urgency of operational requirements.
- Refueling of aircraft is often performed utilizing improper strainers or filters.
- Aircraft are often haphazardly loaded with people and/or articles of unknown weight, thereby exceeding CG limits.

Let's follow the chain of events of an H-46 rescue crew involved in flood relief.

Two pilots and two crewmen checked in with mission control at 0600 and were assigned a resupply mission. The pilots noted an outstanding gripe or two on the yellow sheet. (See box.) The one gripe that caught their eyes was "SAS *(stability augmentation system)* light stays ON in BOTH." (That meant only one of the two systems was operating correctly.)

After takeoff, the HAC made a quick check of No. 1 and 2 SAS and discovered the yaw channel of No. 1 to be nonfunctional and the roll channel to be weak. No. 2 SAS operated satisfactorily and was the system selected. The ASE (automatic stabilization equipment) also checked OK. After the first mission was completed, they were assigned a second. It, too, was accomplished routinely. During both missions, however, an occasional kick in the controls was felt as the aircraft whirled along. Rain had been falling steadily for 3 weeks, so the pilots were used to these kicks.

The third mission of the day was also successful, except that the pilot experienced additional control problems (resistance in lateral cyclic movement and rudder action). A satisfactory inflight control check was made on the way back to base. After landing and shutting down, the HAC instructed his crew chief to unbutton the aircraft and make a visual check of the flight control system while he discussed the problem with an experienced postmaintenance inspection pilot. The crew chief's inspection revealed no discrepancy, and the discussion between the pilots was inconclusive.

Then followed the fourth and last mission the aircraft would ever fly. This mission involved delivering 3000 pounds of supplies, carried internally, to another village. The pilot made a low pass over the village to select the most suitable landing zone – and chose a churchyard. Unlike the other missions, there were no native policemen in sight, so they decided to land and ask a priest to take charge and dispense the supplies.

The landing zone was a clear area, 225 x 162 feet, with a couple of trees in the zone, but these were at the

Yellow Sheet Gripes

The helicopter had been test-flown 4 days previous to the rescue missions, after a 119-day check. It was certified UP for VFR flights and listed the following discrepancies:

1. APA-89 removed.
2. Aft transmission drip pan missing.
3. IFF not working.
4. Aft yellow blade will not fold.
5. No. 1 SAS roll channel out – no parts.
6. SAS light stays ON in BOTH.

extreme edge and were not considered obstructions to operations. *As things turned out, one was.*

After landing, the priest agreed to take charge and asked that the supplies be unloaded and stored in the church. The aircraft had been parked facing the church, so the pilot decided to fire up and make a 180-degree turn-on-the-spot to facilitate unloading through the aft ramp. The pilot hovered the aircraft and then began a left turn. The area was under water, so the HAC had poor surface reference. During the turn, the crew chief noticed that the after blades wouldn't clear the tree and advised the HAC. The pilot tried to move forward away from the obstruction, but the helo would not respond to control inputs and drifted backward just enough to chop off the top of a tree with the after blades. Blade imbalance ensued, and the aircraft rolled onto its starboard side and burned.

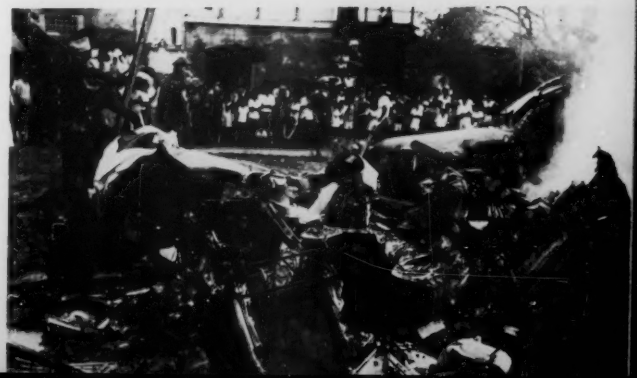
The crew escaped the burning helicopter without injury, and no one in the crowd of 200 onlookers was hurt – even though pieces of rotor blade shrapnel zinged into nearby buildings.

The AMB's (aircraft mishap board) conclusion, with which one endorser agreed, was cause undetermined. Other endorsers disagreed and blamed the pilot for failure to maintain clearance from obstacles in the landing zone and for flying with a known control discrepancy.

It's easy to put yourself in the HAC's position and appreciate his preoccupation with being considerate of those who would have to muscle the supplies into the church. Nevertheless, it was his undoing.

An accident occurred – a major one. An operational aircraft was destroyed. Every TPC, PPC, CAPC, and HAC must remember that his designation carries with it ultimate decision-making responsibilities.

On every mission, command decisions of some kind are necessary. They may be made without much thought, they may be made after consultation with others, or they may be made alone after much deliberation. In any event, all factors must be weighed, and the possible consequences considered. This is the essence of command responsibility.



"Anti" Who?

Dear Scribbles,

If you knock off that alphabet soup long enough to read something more sensible, I got real news for you. You should get this in time for the next air wing deployment to Fallon, and you better find space for it, hack, or I'll have your guts for garters.

The deal is this: Gals in my Lib chapter are hot after me to cut the modesty bit and quit hiding my light under a Navy Exchange gedunk truck. Now, I never made the scene with a lot of flaunting, but I got to agree they have the big picture. It boils right down to credit, man.

Why should I knock myself out keeping careless pilots, mechs, and techs from doing themselves in and tiptoe around like a speechless spook? What's the future? And all the while my male-chauvinist pig-of-a-nephew, just by being the nastiest kook this side of Jupiter, gets himself glorified with top billing as some sort of great Dennis the Menace. "Murphy this" and "Murphy that." Bah! You nuts gotta be miserable to be happy? Sometimes I even get to wondering if he's right and I'm wrong. Maybe you Dilberts *do* enjoy collecting lumps on the head.

Remember the time Murph reversed the hydraulic lines and the landing gear came up when the engine was started? I made you download the ordnance before turnup. And what about the time a passing fuel truck (driven by you-know-who) whipped that dangling ground wire around your feet? If I hadn't happened along and busted it quick, you'd be a walking skin graft . . . if you could walk.

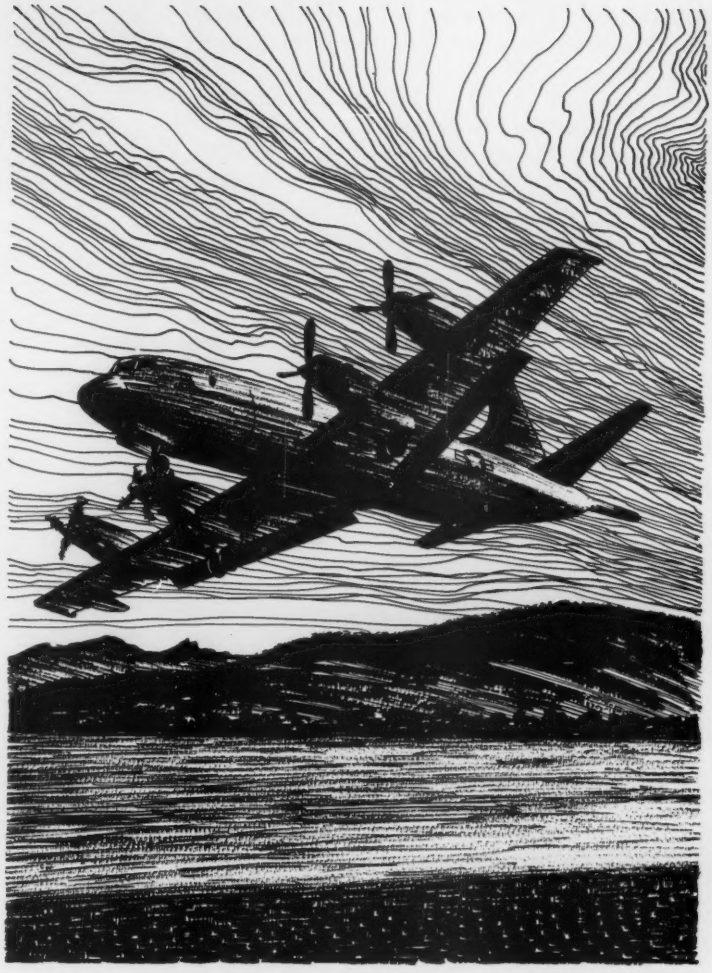
Anyway, I'll be out on the weapons deployment again this year as usual, and I get around fast. You just let all those mosquito-bitten, rained-on clowns know that when their skyhooks almost fall down, when they dump 100 gallons of fuel on the flight line, but it doesn't catch fire, and they almost, but not quite, buy the farm driving back after a night at Ma's, Auntie Murphy is the likely-why-not.

Sure, I lose a few, but I think I bat a lot better than .500 against my skunky nephew. And I say again, doodles, I'm fed up to here with all this devil-worship noise the louse thrives on. From now on, baby, and you better believe it, let's hear it – loud and clear, I mean – for good old Auntie Murphy. Or maybe you'd like to try a weapons deployment with me picketing on the sidelines? That would be something, let me tell you. Yeesh! Murph would slaughter you.

Your Auntie M.

Bravo Zulu

LCDR R. E. Ericson, VP-11



AFTER completing a night reconnaissance patrol off Vietnam, LCDR Ericson, a veteran patrol pilot with over 4500 hours flying experience, initiated restart of his No. 1 engine which had been loitered for fuel conservation while on station. After lightoff, the engine accelerated to about 70 percent, began to fluctuate between 60 and 70 percent, and then appeared to have stagnated.

LCDR Ericson elected to feather the propeller and secure the engine using the E-handle. A subsequent attempt to restart the No. 1 engine yielded the same results and was again terminated by pulling the E-handle. At this point, LCDR Ericson declared an emergency and headed for NAS Cubi Point, where VP-11 was deployed. Shortly after leveling at 21,000 feet, the firewarning horn and light for No. 2 engine came on. The crew immediately secured No. 2 and completed the emergency shutdown checklist.

LCDR Ericson called for maximum power on engines three and four. He was able to check his descent and level off at 10,000 feet. At this point, he decided to divert to U-Tapao, Thailand – much closer than Cubi. But he was not home free yet. The weather at U-Tapao, while better than that at Cubi Point, was still such that an actual GCA would be required.

Things went well until the final controller called for a right turn to final for runway 36. With full right aileron, full right rudder, and 1500 horsepower on engines three and four, the *Orion* would not turn right. Finally, LCDR Ericson turned the aircraft by momentarily coming back to 500 horsepower on the engines, then reapplying power to maintain his glide slope. At 500 feet, the aircraft broke clear of the clouds, *and an uneventful, night, two-engine landing was made.*

LCDR Ericson and his crew, by their professional ability and exemplary performance, successfully coped with a difficult emergency situation, thereby saving a valuable aircraft and its crew.

Well done!

Don't Sweat It

Submitted by VP-45

PAPA-THREE-CHARLIE; new, sophisticated and *safe*. A full crew, galley, racks, and *safe*. Air-conditioned, bucket seats, room to stretch your legs, and *safe*. What could be better than safety and comfort, both in the same package?

This aircraft, as well as all multiengine aircraft, possesses one inherent and possibly fatal weakness – the human element, *her crew*. For, while multiple backups, crew coordination, and sophisticated systems increase one's confidence in the aircraft, they may also lower one's guard against system failures and unexpected emergencies. Isaac Newton stated, in effect, that for every positive action there exists a negative reaction. The advantage of the crew concept is well-understood. It is the resulting disadvantage – *the overreliance on other crewmembers while shortcutting our own safety responsibilities* – that merits a critical look at this time.

A crew concept involves teamwork. This means that each pilot, flight officer, and operator must concentrate on more than just evaluating his own performance. Constant attention must also be directed to each other's work. Safety of flight is assigned the PPC. With advanced mechanical and electrical systems incorporating new degrees of complexity, however, each individual must exercise continuous scrutiny of all components under his supervision.

Navy funds, readiness, and most importantly, *human lives* are placed in constant jeopardy by a "don't sweat it" attitude on the part of any one flight crewmember. This attitude can easily be assumed by any number of individuals. How about LT Joe "Seat of the Pants" Jones, hotshot pilot with impressive credentials – 3000 hours, no violations, no accidents, and *extreme* self-confidence? Or take LT Bob "Killer" Burns. Place him at a TACCO tray and instantly his eyes twinkle. His fingers dance across the myriad of buttons, and the target is pinpointed to a gnat's hindquarter. Again, Bob performs his job with the best of them, but when it

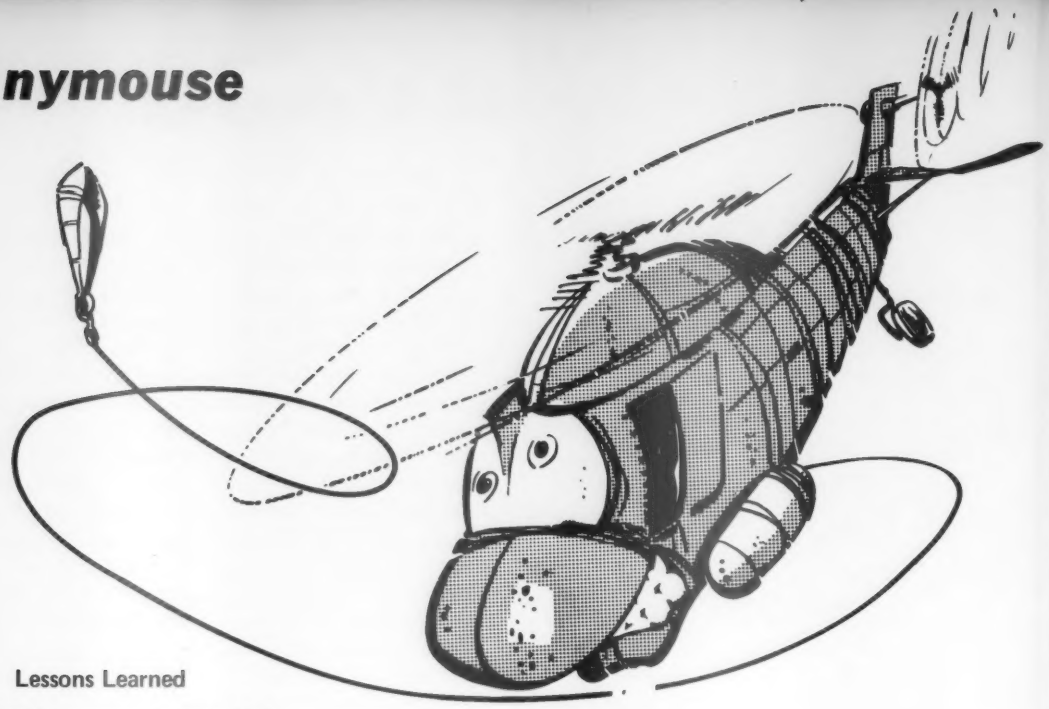
comes to making safety demands upon himself and the operators in the "tube," his "my crew will know what to do when the time comes" (*i.e., no sweat*) attitude endangers the life of each crewmember and jeopardizes the readiness of the squadron.

And then we have Jim "which side is starboard?" Brown, the rookie NAV/COMM fresh from the RAG . . . too green and too involved in inertials to remember safety training. Besides, he's in a squadron now, with the pros. They know what they're doing. And finally, AW1 Tom "I should have made chief" Smith. He doesn't need safety drills – "knows his stuff cold." True, he isn't too sharp on first aid and isn't knowledgeable of his buddies' responsibilities in an emergency, but he has the emergency signals down pat.

Advanced, proven systems are only part of operational readiness and ultimate mission success. NATOPS and professionalism fill the remainder of the accident-free picture. Thus, the collective attitude of one's crew and the methods employed to compare this attitude to standard safety procedure will establish a pattern that, once conceived and executed, may progress to an almost mechanical discipline. Caution is often inconvenient and, therefore, it must be established as the norm rather than an occasional interruption of an otherwise loose routine.

Any crewmember, by virtue of the fact that he has some control over the operation of a 100,000 lb aircraft, is a potential candidate for manslaughter. A "no sweat" attitude on any one man's part opens the door to disaster. Each and every physical and mental miscue may not take a life, but combinations of such lapses increase the risk of an already imperfect business. A crew is only as good as its weakest individual, and the safety of each flight rests on the shoulders of each crewmember. "Sweating it" could be a lifesaver. ◄

Anymouse



Lessons Learned

A UH-2A crew was being briefed on hoisting procedures. The mission was to be a no-sweat local training flight to give a new pilot and a crewman practice in hoist ops. Two designated (8285) reserve aircrewmen were to conduct the hoist ops, then the trainee was to try his hand. We always use a man in the water to simulate a rescue with as much realism as possible.

Preflight, takeoff, and the selection of a shark-free area to operate in went normally. I lowered our swimmer "survivor" into the water, and we commenced a rescue approach. We completed one approach with all conditions normal. The "survivor" was quickly "rescued" and lowered into the water for our next approach. (I thought it best to demonstrate one more for the trainee.)

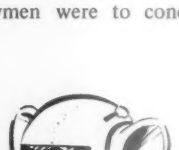
Our second approach was normal until we were over our man and lowering the hoist. A man being rescued is at the mercy of the sea. When waves move up, man moves up. I lowered the heavy-weighted hoist right on target. (The hoist has a heavy weight on the hook end.) All conditions were indicating another good rescue. Then came the waves. Wave up, man up. Crunch one weight, one head, one semiconscious "survivor."

I quickly informed the pilot of this, and he (the instructor) took over the controls. Due to the experience of our swimmer and his will to survive, he was quickly rescued – for real this time.

Reasons for dangerous hit on head: 1) new squadron just beginning to train; 2) no helmets available for swimmer to wear; 3) no forethought on anyone's part about the possibility of this happening; and 4) little or no attention given by pilots during the brief to the crew because the two experienced crewmen had both made actual rescues. Therefore, crew brief consisted of me, the senior man, discussing the mission with the other two aircrewmen.

Result: one aircrewman in down status 5 days with minor head injury.

Nevertheless, there is always



The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT, PREVENT AN ACCIDENT

good even in bad. The squadron had an intensive all-aircrew and pilots' meeting that day. Our PRs managed to come up with some old surveyed helmets to use on training flights of this nature.

So, to any downed aviator who thinks he can do without his hardhat during helo rescue – beware!

– Later –

One month after our encounter with the head injury, our squadron learned another lesson. This time a swimmer, myself, was lowered to practice rescue in a channel which runs from USS Boat Dock to NAS Homefield. It's about 100 yards wide and 2 miles long.

Three approaches were accomplished with very satisfactory results. On the fourth approach, the initial turn was wide, followed by two normal turns. The last turn to where the swimmer [me] should have been produced no more than blue water and sandy beach.

I could see the helo from the water about 3/4 of a mile to my left. They seemed to be looking all around for me, but couldn't manage to ascertain my position. The helo left its original pattern and began a wide sweep. On the third sweep, I was hoisted aboard after an hour in the water.

Problem: No means for swimmer to signal helo.

Reason: No ordnance issued with old surveyed suit and hardhat.

Contributing factor: Channel had currents of which neither swimmer nor aircrew were aware.

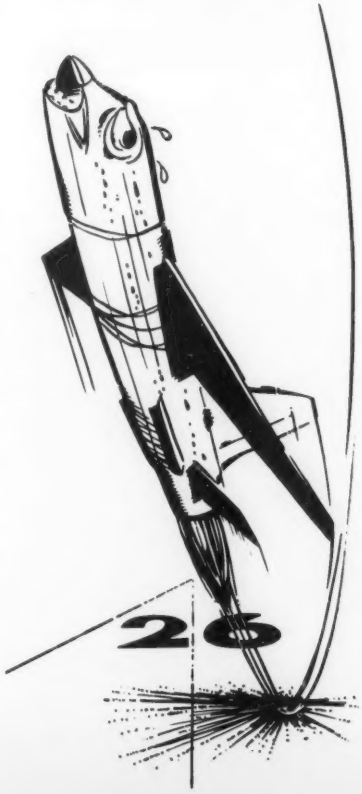
Solution: Back to paraloft – one web belt with pouch holding three flares, 1 signal mirror, 1 whistle.

Both of these incidents show no matter how easily . . . under no stress . . . with favorable conditions . . . "small" things can turn into serious matters.

Wisermouse

Another Convert

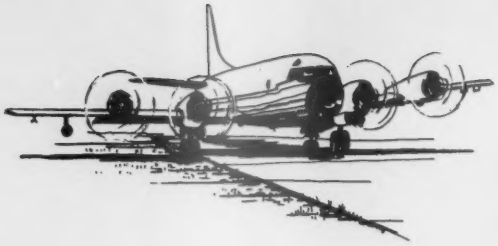
I WAS on an extended cross-country in a *Crusader* one day when perfect CAVU weather lured me out of APC to continue the last 100 nm of my flight VFR to a fairly familiar refueling stop. Upon cancelling IFR, I concentrated on observing the beautiful mountains and desert around me. I was about 9000 feet MSL, 15 nm from landing on RW heading, with the 4200-foot high field in sight. I was in an easy descent at a comfortable 325 KIAS when I called the tower for landing instructions. They advised me I should switch to approach control for radar handling. I thought it rather superfluous considering the weather, my position (which I had reported), and past experience with the field, but I complied. Now at about 10 nm, I contacted approach control and received lots of local information, was told what to expect, and was questioned as to my position. I replied that I was now around 5 nm from the RW and was in a good position to enter the break and land VFR. They were surprised by my position and agreed that I should enter VFR and cleared me to switch frequency.



By this time, I was 3 miles out, so I pushed over from about 7500 feet and eased into a right bank for a lineup correction. Then I looked inside the cockpit to switch back to the tower. A stuck knob delayed my head in the cockpit for maybe 10 seconds. When I looked up, all I could see was concrete and the Numbers 26! As I made a frantic Max G pullout from an attitude that I estimated was 35 degrees nose-down and 45 degrees angle-of-bank, I croaked a request to break to the tower. They replied that they didn't see me. That was because they were looking up from their 75-foot high tower instead of looking down where I was!

After landing and a quick trip to the head, I reflected about the reasons for this near catastrophe: Unneccessary frequency changes at the last moment (my viewpoint), using habits developed around a 500 foot elevation homefield when at a 4200 footer, various egotistical desires to make a "good looking" entry, and the reasoning to be VFR in the first place. The old rule "AVIATE, NAVIGATE, COMMUNICATE" came to mind and I realized that, regardless of reasoning, my violation of that rule put me within 1 second, or less, of buying the farm. I wonder if the accident board would have ever figured out what happened? I wonder how many lives and airplanes are lost because of failure to adhere to that most basic, concise rule: AVIATE, NAVIGATE, COMMUNICATE.

Crusadermouse



IN MUD UP TO HERE

THE PPC and PPC under instruction as a prospective instructor pilot were scheduled for a 3-hour local training flight which included demonstrations of some of the more common mistakes made by pilots under instruction. Both pilots were well-qualified, with the PPC having logged some 2100 hours in the P-3 and the prospective instructor having 1700 hours total with 1400 in type. The flight engineer had flown over 4800 hours in type.

After completing 2 hours of high work, which included simulated failures and emergencies, the aircraft proceeded to an outlying field for landing practice. Following a full-stop landing, the aircraft was brought to a stop on the taxiway while the PPC went through the motions of strapping in . . . but intentionally failed to properly secure his harness and seatbelt. This omission went unnoticed by the PUI.

Other training evolutions were conducted on the ground with the prospective instructor pilot eventually noting the improperly secured safety equipment. The PPC then emphasized the need for closer supervision of the "student" to preclude these seemingly rare but potentially dangerous events from occurring on actual training flights.

When the PPC was told by the prospective instructor to properly position his seat and strap himself in, the P-3 was traveling down a narrow taxiway. The PUI then placed his hands on the power lever, and although no further verbal exchange took place, the PPC assumed that the prospective instructor was now in control of the aircraft. The PUI, on the other hand, assumed that the PPC would closely monitor aircraft movement and maintain control of nosewheel steering, even though he had been told to strap in. He saw the PPC's hand come off the nosewheel steering and busy himself with the straps, but assumed the PPC was performing another training evolution.

The prospective instructor now eased No. 1 and 2 power levers into reverse and tapped the port brake to stop a slight right drift which the aircraft had developed. The PPC, who had busily engaged himself in the tasks of strapping in, now looked upwards

and observed No. 1 and 2 power levers being retarded considerably. Checking further, he saw that the aircraft was in imminent danger of running off the taxiway. He reached for the nosewheel steering to stop the right drift.

The nosewheel turned to the left, but had no effect on the aircraft. This indicated that the starboard wheels were already off the taxiway into soft ground. The aircraft was quickly brought to a stop and the engines secured.

The ground was soft from recent rains, but fortunately only to a depth of about 6 inches, to which the wheels quickly settled. An Air National Guard unit stationed at the field soon arrived with a tow bar, some heavy steel matting, and the "duty" shovel.

The aircraft was moved forward onto the taxiway with no further problems and, more important, no damage.

In retrospect, I cannot help but wonder how an incident such as this could have occurred. Two well-experienced pilots and an engineer with many hours in the aircraft somehow got sidetracked. Granted, it was a narrow taxiway, but there was still 4 to 5 feet on each side of the mainmounts if the nosewheel had been kept on centerline.

The lessons learned from this mishap are several:

- As in the air, where control of the aircraft is passed from one individual to another by positive action and acknowledgement, so must it be on the ground. Let there be no doubt as to who is running the show.
- Two sets of eyes are always better than one. If one of the pilots is overly involved in other activities or must leave the seat, the aircraft should be stopped until the pilot has returned and is completely strapped in and ready to go.

Mudmouse

Thanks for an interesting account of your embarrassing goof. No one is immune from the dangers of inattention.

Needed: SOP!

By CDR Donald E. Beck, USN
Naval Air Test Center

"This article does not necessarily reflect the opinions of COMNAVSAFECEN, but there is justification for serious consideration of the ideas presented. CDR Beck, an authority in his field, offers valid reasons for a good, hard look at the problems of Helicopter/Ship Dynamic Interface Envelopes." – Ed.

WHAT does the term "Helicopter/Ship Dynamic Interface Envelope" mean to the rotary-wing community? Unfortunately, only a few SH-2D drivers, some LAMPS ships, and part of the RDT&E community know its meaning and significance to the fleet. Generally, it is a foreign term, when it should be a household term for all helo shipboard operations.

"Dynamic Interface" refers to the engage/disengage and launch/recovery capabilities of a particular model helicopter in the at-sea environment of a particular class ship. In layman terms, it defines safe operating limits for a given aircraft/ship operating condition. It somewhat parallels the launch/recovery bulletins of the fixed-wing carrier Navy.

Our fixed-wing brothers never have any doubt as to wind-over-deck required for a given catapult shot. Stringent SOP has been implemented to prevent unsafe cat shots with regard to end speed. Their safety record in this area has been outstanding. Procedures have also been standardized regarding shipboard

recoveries. The advent of automatic carrier landings is the culmination of a multimillion dollar project designed to increase flight safety in a critical area. The fixed-wing community has taken a professional approach to optimizing key evolutions of shipboard operations.

Now, let's see what prevails in the rotary-wing field. With the exception of the SH-2D on the DLG-26, DE-1052, and DE-1040 class ships, little or no guidelines are published regarding safe envelopes for launch/recovery. As a result, there have been numerous avoidable mishaps in helo shipboard operations. We've had too many reports of "dribbled over the side and settled in the water" and "aircraft landed with tailwheel over the side" and the like. Many accidents have occurred during attempted landings/takeoffs in such hazardous conditions as pitching and rolling deck, extreme turbulence, downwind conditions, and major obstructions near the landing spot. The basic go, no-go decision has been left to the pilot, and he is the scapegoat assigned pilot error, even though he may have been trapped by factors beyond his capability to predict. In other words, Joe plays the game and takes his chances.

Why does this condition exist? Good, safe guidelines should enhance pilot longevity and reduce needless loss of material and endless hours of aircraft repair. A review of Navy helicopters can help explain why we are so far behind.

In general, helicopters were basically a daylight VFR or "big moon" night mission machine until the early 1960s. In addition, the majority of shipboard takeoffs/landings were conducted from CVA/CVS/LPH type ships. Shipboard personnel handling these aircraft were reasonably familiar with helicopter limitations. In spite of their usual acceptable knowledge of helos, however, there was often a big push to launch/recover helos under far less than optimum conditions. How many times have you seen the CV skipper launch his fixed-wing birds and then turn downwind to conduct helo ops? This is all too often the case despite high-density altitudes and light winds across the deck. Where the birds are near max gross, a single-engine emergency on takeoff or landing might spell catastrophe.

The inherent flexibility and utility of the helicopter combined with the demonstrated skills of experienced pilots have led many to believe that a helicopter can accomplish any landing/takeoff/hover maneuver regardless of environmental conditions. Many helo pilots at one time or another have been involved in a dispute regarding required operating conditions. NATOPS conference reviews often become heated while airing these subjects. Pitching and rolling decks, black nights, poor spot location, turbulence, pilot inexperience, equipment failure, and other factors are often disregarded. Our flexibility and "can do" attitude have been our own worst enemies.

As we turn the discussion to the present, let us store these historical lessons in the memory bank. The number of helo operations from platform-configured ships are increasing at a rapid rate with the introduction of LAMPS and the Sea Control Ship. The all-weather helo mission is now a reality. On occasion we conduct operations long after the fixed-wingers have ceased operations due to weather or sea state. Almost all newly constructed ships are designed for helo operations. We presently have 85 classes of so-called nonaviation ships with 450 platforms capable of conducting helo launch/recovery.

The ship certification program has existed for a number of years. NAVAIRSYSCOM, NAEC, and NAVSHIPSYSCOM have been hard at work trying to design/modify landing platforms so that obstructions, landing areas, lighting, fueling, etc., pose no hazards. This program is aimed at getting the ships' hardware

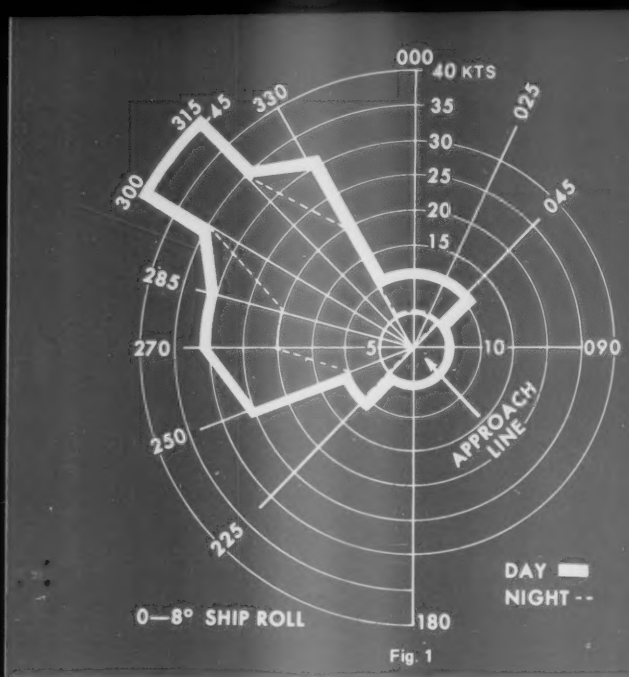


Fig. 1

Fig. 2

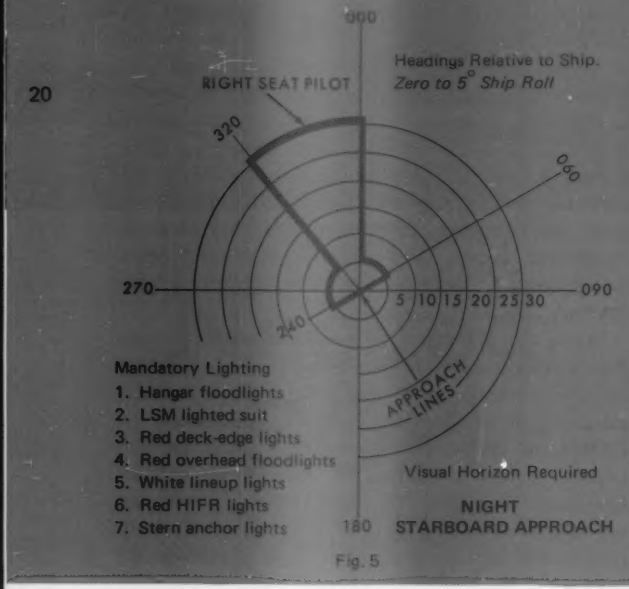


Fig. 5

Fig. 6

compatible with minimum standards, but no major emphasis has been devoted to determining *which* flight operations are safe. As an example, those of you who read SPLASH (Shipboard Platforms for Landing and Servicing Helicopters) and note the category "safely landed" aboard a class ship for your type helicopter should be cautioned. Initially these lists were compiled by sending a group of photos of all helos with a questionnaire to the ship and asking, "Have you ever landed any of these helos on your ship?" So it is important to check out the deck dimensions, obstructions, etc., before operating helicopters from any platform about which you are not absolutely certain.

The Rotary Wing Branch at NATC (Naval Air Test Center) has recommended establishment of a comprehensive program to test helicopters on different

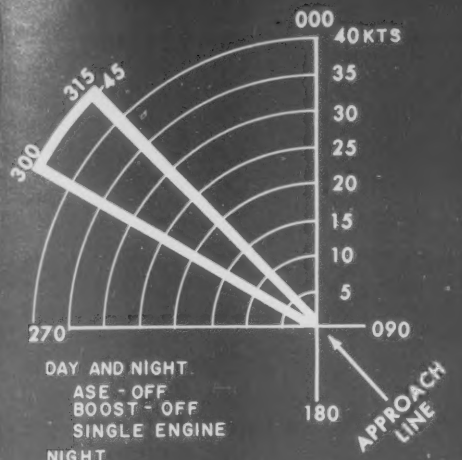
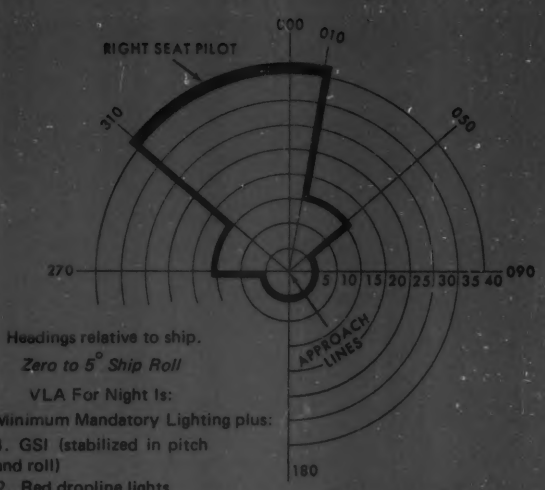


Fig. 3



STARBOARD APPROACH

Fig. 4

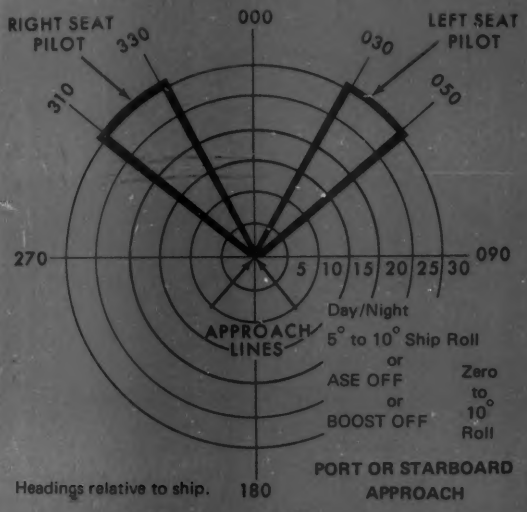


Fig. 7

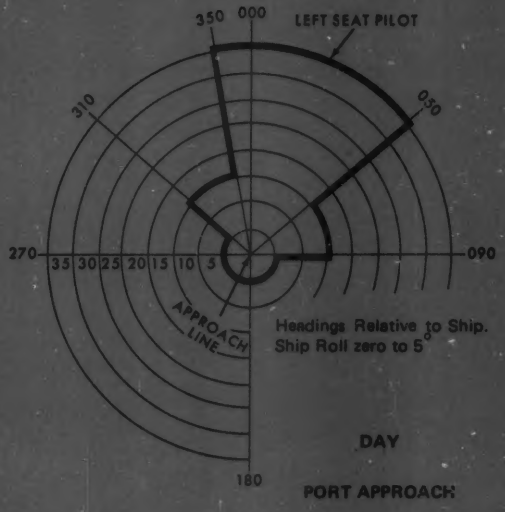


Fig. 8

classes of ships to ascertain safe day/night operating envelopes during the launch/recovery phase. Early testing of the H-34, H-1, H-2, H-3, H-46, and H-53 in shipboard operations were conducted during BIS (Board of Inspection and Survey) trials just prior to fleet introduction. In general, these tests were a "quick and dirty" look to see if the aircraft could survive in that environment and to determine gross deficiencies. These helos were all designed to operate from large-deck ships, and lack of funds precluded development of their operating envelopes.

During the past 2 years, NATC has been successful in developing envelopes for the SH-2D on DLG-26 and DE-1052 class ships and for the SH-3H on LPH-2 class ships. For example, a NATC flight test, rotary-wing pilot recently completed a 30-day TAD tour with HC-7 on

Yankee Station. This period involved project work to determine envelopes for the H-3 on DLG-6/16/26 class ships. It also entailed considerable combat SAR operations including a rescue under fire. The untiring assistance provided by HC-7 personnel was paramount in the success of this program. Other programs were generally "piggybacked" on VLA (visual landing aids) or deck strength tests. Helicopter/ship dynamic interface envelopes must be developed for other helicopter/ship combinations to ensure safe operations. In addition, the confusion which sometimes develops between ship and detachment personnel concerning operating conditions would be eliminated.

I invite your attention to Figs. 1-8, which depict wind envelopes developed from actual flight test data for the H-2D aircraft at max gross weight on the DLG-26/DE-1052 classes. You will note that required relative wind conditions vary with ship's motion, visual landing aids available (if night), aircraft condition, pilot seat, etc. It is interesting to note that the old thumb rule of a 30-degree port wind puts the pilot on the outer edge of the recommended envelope for the DLG-26 class.

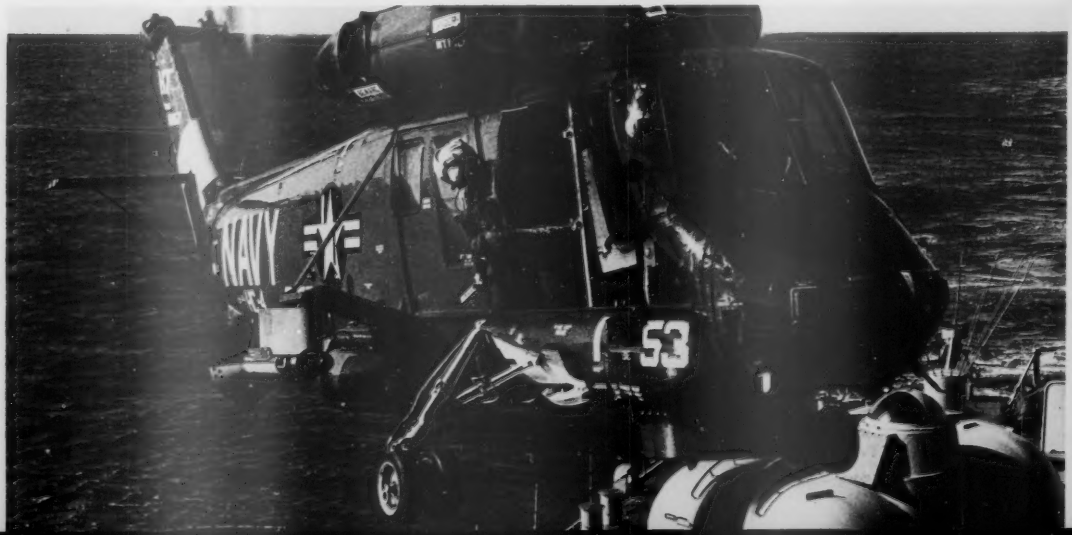
During tests, NATC pilots fly the bird to its absolute limit (control margin, handling qualities, power margin, etc.) and then fall back to provide a buffer safety zone for the fleet pilot. Our basic aim is to protect the pilot, but at the same time not hamper flexibility and operational capability. Oftentimes, squadron pilots flew with NATC pilots on these tests. We were anxious to get their comments, and their opinions were heavily weighed. Also, we have used fleet pilots during evaluation of lights and landing aids. These pilots were unanimous in their approval of the NAEC glide slope indicator as a means of enhancing safety and reducing the "pucker" factor of black-night recoveries.

Good deck lighting on small platforms enhances development of larger operating envelope – especially for conditions of high sea state and turbulence.

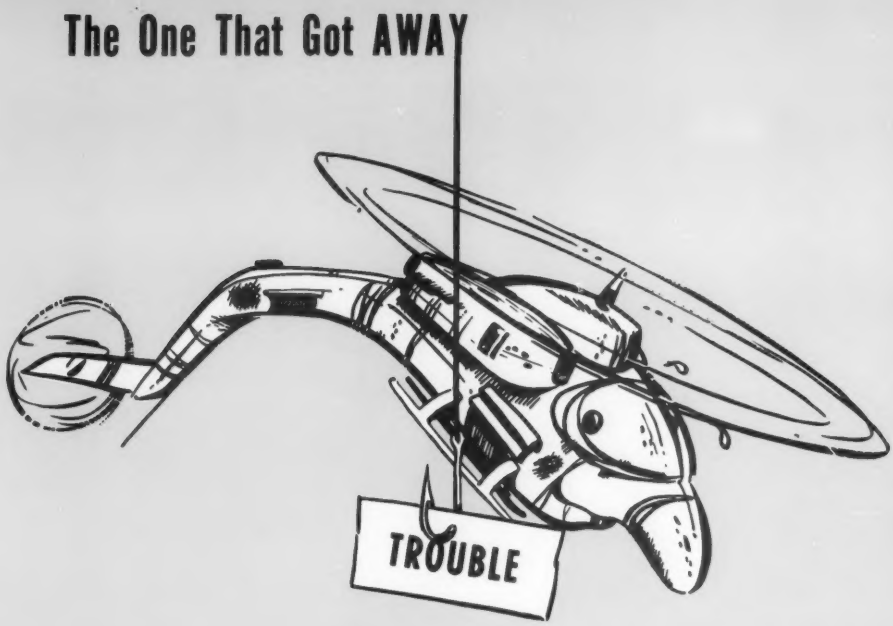
Some of our dynamic interface test results have been criticized for being too restrictive or too loose. At times, we are unable to get high ship's roll angles and hence have to limit recommended envelopes to the maximum roll condition tested. We do not extrapolate or "guess" if we haven't been there ourselves and ascertained that it is safe.

We also have found that the roll period (seconds from level deck to level deck) has been a critical parameter. For the same sea conditions, the DLG-26 class ship has a 9-second roll period while the DE-1052 class has a 5-second roll period. Ship's pitch has not been nearly as critical as roll on the aircraft/ship combination tested thus far. This is not to say, however, that pitch may be less critical than roll in classes having platforms farther aft. Each class ship has its own motion pattern, and all classes go through periods of random motion nearly impossible to predict. Turbulence is another factor that can't be predicted. In one test, we found turbulence to be no factor until the pilot was nearly over the deck, at which time the pilot felt he was being "sucked" into the superstructure.

In closing, the flexible "can do" attitude in fleet helicopter operations is commendable, but it has caused needless accidents. We continue to operate by passing information by "word of mouth" from pilot-to-pilot, or "play-it-by-ear" in our engage/disengage and launch/recovery evolutions rather than by adopting the professional approach taken by our fixed-wing cohorts. A "Dynamic Interface" test program to determine safe operating envelopes for our aircraft/ship classes will greatly enhance safety in the rotary-wing world. NAVAIR/NATC, with fleet assistance and cooperation, is standing by, ready to conduct all necessary tests. But we need fleet response regarding your needs. I pass the lead over to you . . . rotorheads of the fleet. ◄



The One That Got AWAY



IT was a dreary winter morning, as only dreary winter mornings along the southeast coast of CONUS can be. It wasn't snowing, but if the temperature dropped a few degrees, it would. It wasn't IFR for helicopters, and yet, it wasn't VFR either. Yech!

Whatever it was, it was good enough to launch our training flights in the AH-1J. I saw the others suit up and go, so I put my student in the back seat for a fam refresher. After we launched, I found the ceiling just above IFR minimums, so we whirled away to an auxiliary field for an hour's work.

Then it was time to go home, but it wouldn't be as easy to get back since the home field had gone IFR. After leaving the auxiliary field, I had to drop down to 100 feet above the trees to see anything. While orbiting a farmer's field, I called the tower for a GCA frequency. The controller said, "Wait" – followed by 15 minutes of silence.

The next contact with the tower resulted in instructions to contact Cherry Point Approach. No way! We were much too low and too far away. I persisted in my request for a GCA frequency and finally got one. We were cleared to 2000 feet and entered clouds. I developed a mild case of vertigo but decided to fight it.

My student had turned off his UHF and didn't copy our clearance or the frequency assigned. I couldn't let go of anything. Finally, we got somewhat squared away as we climbed to altitude and were honored with a call on Guard. I checked, and we were one number off the assigned frequency.

Instructed to descend to 1600 feet, down we went. Now what's that? Damn if the engine chip light didn't come ON! To take care of this little distraction, I zeroed out my airspeed. Oops! The rest of the GCA was a bag of worms. We ultimately broke out of the clouds after descents varying as much as 2000 fpm and climbs of 200/300 fpm. If a trace of my approach path had been made, it would have resembled a sine curve.

I have 40 hours of instrument time this half in the bird and have never had any trouble before on actual or simulated approaches. In trying to analyze *wha' hoppen*, I've decided I let the bird get away from me while talking to the tower. I never caught up. My student asked several times if I wanted him to fly it, but I remembered my directions to him were to merely back me up on the instruments.

Notsohotmouse

OK, man, you learned a lesson for free that money couldn't buy. It should stick with you for your entire career. Your own analysis was right on **as far as it went**, *but you didn't mention:*

- *what kind of briefing you exchanged with your student. Did it include what kind of coordination you expected of your student or what cockpit duties you wanted him to perform?*

- *whether you've ever heard of the three priorities of flight – aviate, navigate, and communicate.*

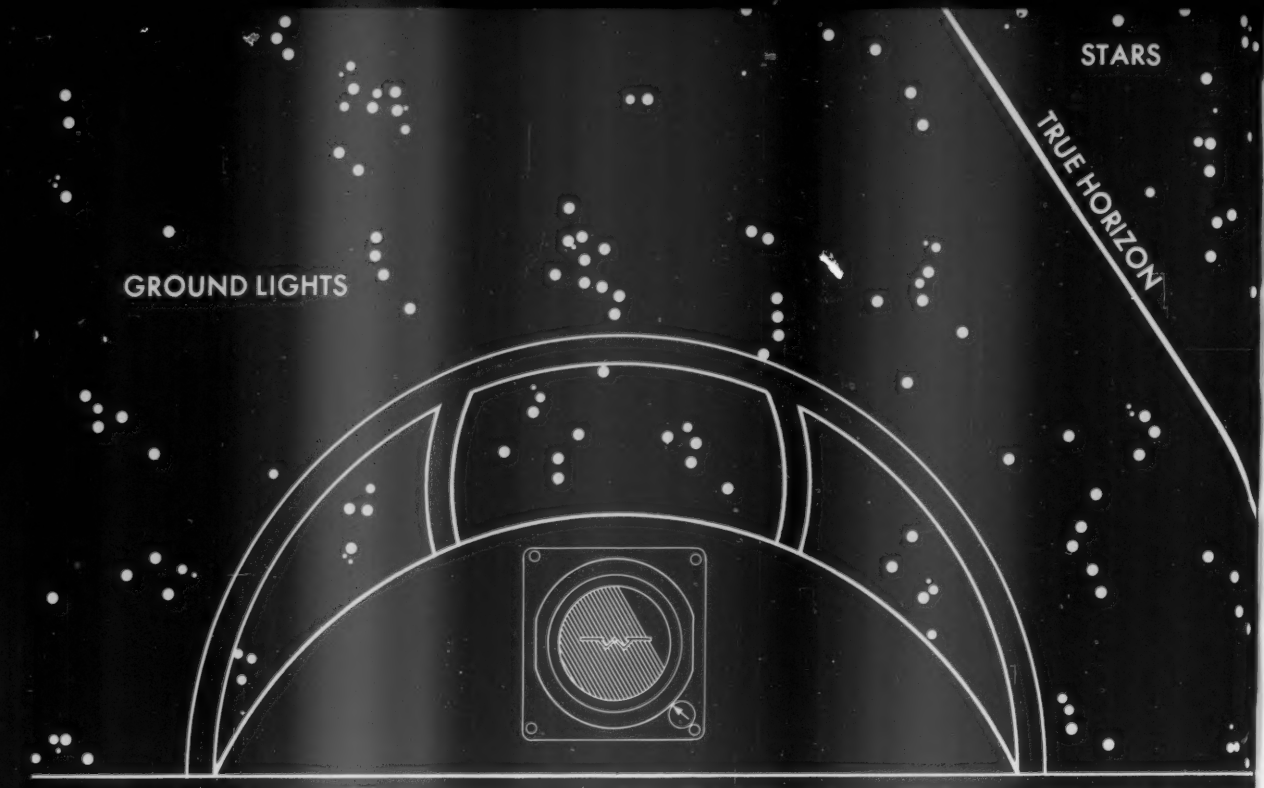


Fig. 1

Blending of Earth and Sky

A JET returning to a carrier after a successful mission entered a normal break turn with 45 degrees angle-of-bank, but after 25 degrees of turn, the nose dropped below the horizon. The aircraft maintained this attitude until impact with the water. Both crewmen were lost.

What happened?

Research has clearly shown that even without any unusual accelerative forces of flight, you can perceive flight as straight and level when you are actually 10 to 12 degrees in error. Greater errors occur with misleading visual information, absence of visual information, or any head movement while you are in a turn.

In the accident described above, if the pilot moved his head suddenly while in the banked turn, he might have experienced disorientation. The flight surgeon surmised that because of the glassy state of the sea and the cloudless sky the pilot was unable to distinguish a definite horizon. Lack of a visible horizon may have then contributed to disorientation.

Completely cloudless or completely overcast skies over smooth bodies of water, starry skies over land with scattered ground lights, or starry skies over water with numerous fishing boats with running lights can lead to disorientation in any pilot or crewman. Figure 1 is an example of misleading visual information which can cause a pilot to confuse ground lights with stars. In this case, the pilot, mistaking the ground lights for stars, puts the aircraft into an unusual attitude in order to keep them above him.

Here, the principle holds: when sensorily deprived and adequately stressed, anyone may perceive an illusion to be reality.

Your only recourse is to observe and trust your instruments and to control your aircraft with strict reference to them. Unfortunately, sensory conflict may exist between the instruments and the misleading visual cue. This can make you think that the attitude indicator isn't working. When in doubt, cross-check your instruments.

Remember: refer to *and* rely on the instruments and as little head movement as possible.

notes from your flight surgeon

A-7 Ejection

A LOOSE lapbelt may have contributed to an A-7 pilot's injuries on ejection. On the positive side, his APH-6 helmet protected him from further injury on parachute landing and may even have saved his life.

During ACM (air combat maneuvering) training, the A-7 entered a spin. Because the pilot had not tightened his lapbelt securely (or perhaps loosened it for body mobility), he was pushed away from the seat, up against the canopy. As the aircraft passed through 10,000 feet, he reached for the face curtain, but couldn't grasp it. He twisted to his right, bent forward, grabbed the seatpan firing handle, and pulled.

Afterwards, he recalled floating down, but didn't remember the ejection sequence or landing. When he regained consciousness, he found that he was hanging in the parachute with the canopy caught in a tree above him. Not fully aware of his precarious situation, he released his Koch fittings and fell to the ground.

Rescuers found him dazed and sitting propped against the tree. His arm was broken, and his knee ligaments torn. Because his double visor mount was shattered and pieces of tree bark were embedded in the outer shell of his helmet, investigators concluded that he was subjected to "considerable trauma" on landing.

"Although the value of the helmet is accepted, it seems justified to mention that, in this instance, this item of flight gear probably prevented a potentially severe and possibly fatal head injury."

Slow Strobe

AN SDU-5/E strobe light activated by a survivor of a helicopter ditching reportedly flashed very slowly – one flash every 10 seconds. The rescued crewman told investigators that he had checked it about a week before the accident. At that time, it flashed once every 3 to 5 seconds.

What is a reasonable expectation for flash frequency of the strobe?

NADC (Naval Air Development Center) states that if the strobe light flashes less than 30 times a minute, the aviator's equipment section should check it out for a weak battery or other malfunction.

Need you be reminded to check your survival equipment before each flight?

LPA-1 Inflation Difficulty

DURING parachute descent after ejecting from an F-8, a pilot tried to inflate his LPA-1. He "jerked hard on the toggles several times." The lower portion of the vest inflated, but the collar didn't.

After the pilot's rescue, the vest was inspected at the squadron paraloft. The left toggle had been pulled, but the right toggle had been pulled less than 1/3 full travel. The right CO_2 bottle was found to be properly installed and airtight. There was a deep dent in the seal. A spare CO_2 bottle was installed and activated normally with a normal pull on the toggle, fully inflating the upper part of the LPA.

For maximum inflation, the design of the LPA-1 necessitates pulling both inflation assembly lanyards down and forward at the same time or the right toggle first, then the left. The right toggle inflates the neck lobe and part of the right waist lobe. The left toggle inflates the waist lobes. When the left toggle is pulled first, there is full inflation of the left lobe and some inflation of the right.

Once the left lobe is fully inflated, it is hard to actuate the right toggle. CO_2 entering the right lobe when the left lanyard is pulled binds the nylon release pin on the right side when the right toggle is pulled.

The design of the new LPA-2 improves on this situation. Actuation of *either* the left or right inflation toggle will partially inflate all lobes. No right-left sequence is required.

Unclogs Nozzle

WHILE working on a P-3, a man tried to unclog the nozzle of an aerosol spray can with a piece of wire. Zinc chromate sprayed into his face and eyes.

Fellow workers carried him to a nearby drinking fountain and flushed his eyes out with water. Then they took him to the dispensary. He was later hospitalized for several days.

You're asking for trouble when you try to unclog the nozzle of an aerosol spray can. Don't. ◄

SAFETY AND PROFESSIONALISM

SAFETY and professionalism are not synonymous, but in normal operations they are inseparable. Safety depends on professional performance. Thus, it is instructive to consider two aspects of professionalism – the need for knowledge and the capacity to make good judgments.

By definition, a professional requires a high level of training and proficiency. Naval aviators and naval flight officers begin their flying careers with an impressive record of education achievement and receive an exhaustive, time-tested program of initial aeronautical training. But . . . this is only a beginning. True professionalism demands that each individual make the acquisition of professional knowledge a *continuing* process. This fact is emphasized by a number of accidents which have occurred during the last year. For example:

• After launching from a carrier, the F-4's landing gear would not retract. The pilot reduced power slightly to remain within the gear-down speed limit, but allowed his airspeed to bleed off too much. On the backside of the power curve, he couldn't recover – even with full burner on both engines. Action based on knowledge of the slow-speed characteristics of his aircraft at high gross weight would have prevented the accident.

• Ditto an A-4C from a naval air station. Unable to get his gear to retract, the pilot turned downwind for landing. Due to his heavy gross weight, the pilot flew the aircraft (climbing and turning) into a near-stalled condition. Incredibly, he mistook prestall buffet for "engine vibration." The final result was an ejection and the loss of an aircraft. A better knowledge of the slow-speed, high gross weight characteristics of his aircraft and correct technique would have prevented this accident.

• Airborne from a naval air station, the pilot of an EA-6A was unable to raise the gear. He turned downwind and commenced dumping fuel. Because of fuel mismanagement (presumably due to lack of knowledge of the system), both engines flamed out, even though there were more than 9000 lbs of fuel onboard. A thorough knowledge of the aircraft fuel system would have prevented this accident.

This is the type of thing MAJ Frederick Shaffer, ASO VMA-131, NAS Willow Grove, had in mind when he wrote the article "Keep the Percentages in Your Favor" in the October 1972 APPROACH. In this article, MAJ Shaffer noted that, based on a 6 months study in his squadron, at least one important aircraft system (hydraulic, electric, fuel, oxygen, engine, navigation, radio, brakes) would fail in one out of five sorties.

His study was based on only one squadron's experience, but the results may be applicable to many. If so . . . think about it . . . on the average, every five times an aircraft is launched, its crew will be faced with a problem, if not an emergency, which requires a thorough knowledge of some aircraft system. With odds like that, are *you* satisfied with what you know about *your* aircraft?

A thorough understanding of one's aircraft is only one facet of professionalism. Professionalism demands considerable knowledge in other areas, like instrument flight procedures, weather, flight physiology, survival, and general and special operating rules and regulations. The list of subjects with which a professional aviator should be familiar is long indeed. A one-line listing of each publication which contains information of direct interest to a professional aviator would fill pages.

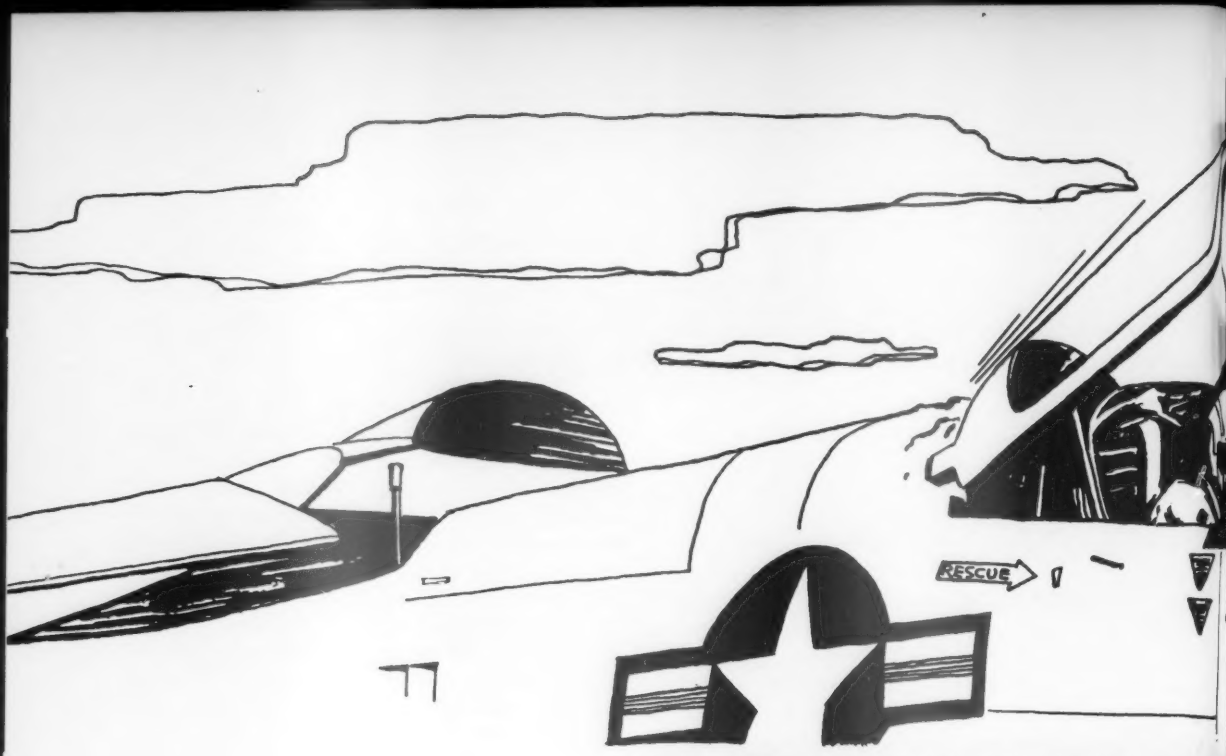
An example of how important it is to understand the rules occurred when an F-8 pilot approached a severe thunderstorm on an instrument flight plan. Calling Center, he requested clearance to deviate from course and circumnavigate the storm. The Center was unable to respond immediately because of a communication overload. The end result was a penetration of the thunderstorm, followed by loss of control and eventual loss of both plane and pilot. In retrospect, it appears this pilot was either unaware of or did not understand the intent of FAR (Federal Aviation Regulation) 91.3 which permits the pilot in command to take emergency action necessary to ensure safety of flight.

The basic point is clear. It is not enough to simply *have* knowledge of rules and regulations. You must *apply* this knowledge to situations. That is, you must make professional judgments. For example, OPNAV instructions specify minimum fuel requirements for IFR flight. Legally, one may plan a flight with a bare minimum of excess fuel; yet, in the absence of compelling reasons, it might be most unprofessional to plan a flight to a destination with marginal weather conditions with only the minimum required fuel.

Professional judgments are easiest when one is armed with both knowledge and experience. Unfortunately, the average naval aviator or naval flight officer often finds himself in situations where he has had little prior experience to draw on. In these cases, making a professional judgment may depend not only upon his own knowledge and the time available to think the matter through, but also upon the extent to which he is able to draw upon the experience of others.

This is the real value of NATOPS and other SOP – being able to draw upon the experience of others. Yet, no one should expect NATOPS to eliminate the need for common sense or to cover every contingency. For this reason, there is a real need for an intensive exchange of knowledge and experience between professionals. Whether it occurs informally in the readyroom, within the pages of a safety magazine, or during the preflight briefing, communication is essential.

In conclusion, safety is well served by professionalism which means, in the simplest terms, a continuing effort to acquire knowledge and develop the capacity to apply it judiciously in all cases. ◄



COUNT THE

REMEMBER "way back when" – those magazines you read in grammar school that would show a tree, and you'd have to find hidden in the foliage several animals, faces, or some such? See if you can find all the errors in procedures, judgment, and supervision in this tale of a troubled cross-country.

Our leading man was scheduled to depart Homebase on a 2-hour training mission in his SH jet fighter, land for hot refueling at a nearby facility, fly another 2-hour training mission, then terminate and RON at NAS South. After filing, the ops boss suggested that he might fly north to pick up some "hot" spare parts needed for a sister squadron at Homebase.

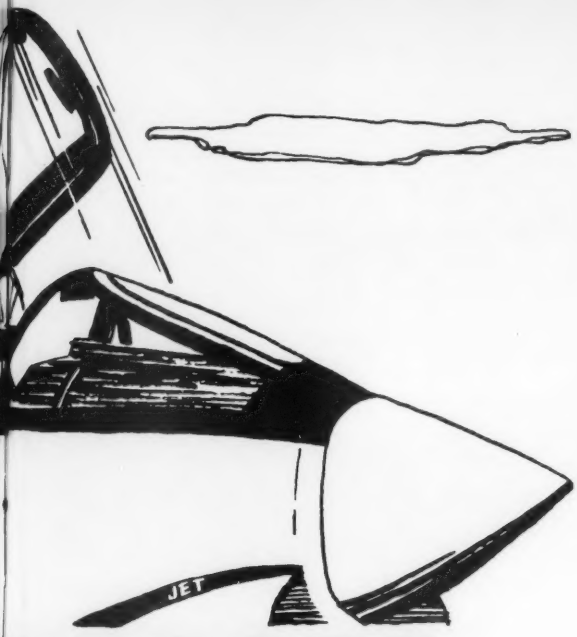
Our hero agreed, leapt into the air, changed his flight plan while airborne, and sped north. Upon arrival, he taxied into the line, came to a full stop, and opened the canopy. It flew back at an excessive rate, sheared the actuator shear bolts, and crimped the skin on the trailing edge of the canopy where it contacted the fuselage.

Subsequent investigation revealed that the cabin pressure regulator had malfunctioned, and that the cockpit was overpressurized when the canopy was opened. The pilot did not dump the cockpit pressurization, check the cabin altimeter (which would have shown a "minus" altitude, and presumably alerted the pilot to difficulties), or hold onto the canopy frame with his hand prior to opening.

After inspecting the damage, conversing with his ops officer and an AME on the phone, and experimenting with the system, the pilot determined that the canopy could be secured. He decided that, due to the limited maintenance available for his type aircraft at NAS North, a one-time flight home was reasonable.

After lighting-off, our friend switched from external electrical power to internal – and got nothing. The generator, which is powered by a turbine driven by 16th stage bleed air (like, *hot*) was inoperative. Reconnecting external power, the pilot informed the tower of his difficulty, requested NORDO taxi, green light for takeoff, and advised that he'd come up on tower frequency when he had obtained enough airspeed to operate his RAT.

All went well until the pilot started to clean up the aircraft. He remembered that the landing gear downlock solenoid is on the secondary bus, and thus not operable on the RAT, so he began to grope around behind the gear handle to manually release the switch. God bless that brilliant engineer who placed it there.



ERRORS

By Crusadermouse

Unable to locate the solenoid, our man was forced to remain a jet powered *Stuka* unable to reach Homebase due to the excessive fuel consumption required.

About three-fourths of the way home was a large and busy AFB, and a few miles across the river was an NAS which has had recent experience with SH fighters similar to our hero's. He landed at the AFB.

It was getting late when he called the ops boss, this time to report the generator failure, and the joint conclusion was that he would RON and return home the next morning. There was some discussion of the gear downlock solenoid.

The next morning, our friend again launched on a green light from the tower, again couldn't find the solenoid, and completed his odyssey as a stiff-legged blowtorch. All went well.

Now that you have the story and have counted the errors, it is well to advise you that the pilot was a LT with 1200 hours in model and series, more than 200 carrier landings, and 150 combat missions. The ops officer was a CDR with even more impressive experience. It is truly incredible that men with those credentials cooperated so willingly to senselessly risk an airplane and a life.

For comparison's sake, here is my list of errors:

1. Some question of supervisory judgment in capriciously changing the scheduled mission. Probably too remote to be a cause factor, but it bears scrutiny.

2. Pilot's violation of NATOPS in failing to dump cabin pressure, check cabin altimeter, or hold onto canopy frame prior to opening the canopy.

3. Pilot's judgment error upon discovering generator failure, in not shutting down to investigate cause of failure. It might have been a break or leak in the 16th stage bleed air line, which could have caused a fire.

4. Pilot's judgment in deciding to taxi and launch without electrical power. In so doing, he violated NATOPS and prudence in the following areas:

a. Taxi without nosegear steering – could cause hot brakes.

b. Takeoff without afterburner. Afterburner takeoff is SOP.

c. Takeoff without fuel boost pumps and flight on RAT with only one boost pump.

d. Unable to transfer some internal fuel.

e. Unable to get engine check on runup because EPR requires electrical power.

f. No fire-warning system during taxi and takeoff.

5. Tower error in permitting pilot to launch without radio.

6. Pilot's lack of knowledge of aircraft – did not know where landing gear downlock solenoid was and therefore could not raise the gear.

7. Pilot's judgment error in landing at AFB rather than NAS, where presumably more knowledgeable maintenance personnel were available.

8. Supervisory error of personnel at Homebase for permitting, if not encouraging, pilot to continue home without checking for cause of generator failure.

9. Pilot's continued judgment error in continuing home the next day in spite of generator failure.

10. AFB tower error in permitting plane to launch without radio.

11. Pilot's continued and aggravated lack of knowledge of aircraft. He still could not raise his gear even after having location of solenoid described over the phone from Homebase.

12. Violation of intent of numerous OPNAV and FAA directives, by flying VFR in high-density traffic areas, or by flying IFR without required equipment.

The whole story is made even more disturbing by two subsequent discoveries. First, the generator failure was caused by the tripping of a simple switch, and could easily have been reset if the pilot had investigated (if he had known how). Second, an S-2 on a CRT flight had landed at NAS North that same day, and upon hearing of the problems, picked up the spare parts. ◄

The Constellation Andromeda

Sometimes a man gets a reputation for wisdom simply because he doesn't have enough money to make a fool of himself.

Will Rogers

Letters

From the UK

Somerset, England – Sitting in the readyroom during bad weather, I was reading various articles from Royal Navy and Royal Air Force publications when I came across some in the *Training Command Flight Safety Review* which you may be interested in. The first is on the old subject of wearing authorized flight clothing. In addition, there is an article on nylon burns with a new twist (at least to me) associated with electricity. One incident involves a maintenanceman receiving an electrical shock that resulted in nylon burn damage more extensive than the shock.

Finally, the last article concerns a glider pilot who hit high-tension lines. He didn't feel the shock, but his nylon socks and terylene worsted trousers melted.

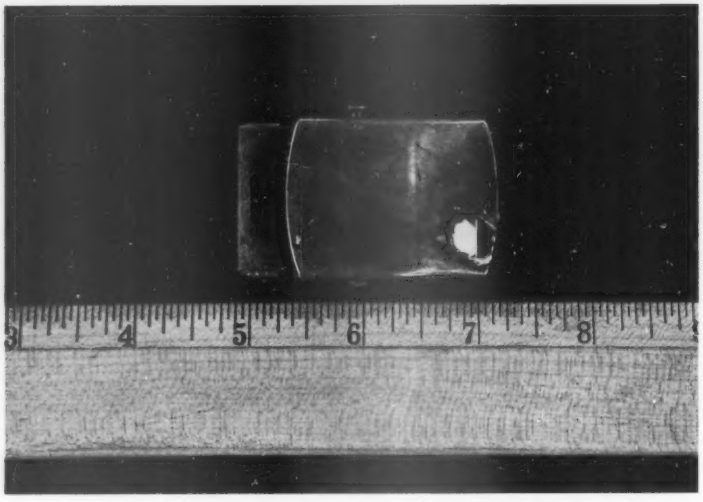
Enjoy your magazine very much. Cheers!

LT L. J. Hendrickson, USN
Exchange Officer
RNAS Yeovilton

● Our staff enjoyed reading the copy of *Training Command Flight Safety Review* you sent – none more than our life sciences editor who found himself quoted. Thank you for writing.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.



"... I tried to think up a witty caption to go along with the picture, but it pretty much speaks for itself."

Melted Belt Buckle

FPO, New York – A new fact concerning safety recently made the scene in this squadron. The poles of the standard 24-volt nickle-cadmium battery *will*, repeat, *will* fit onto the front plate of a Navy-type brass belt buckle with very enlightening results.

A young aviation storekeeper leaned over a newly issued battery which had been placed on his desk. The unprotected battery poles contacted his belt buckle simultaneously, resulting in the pictured damage. A pat on the back is due the local AIMD for successfully recharging the battery prior to reissue.

Potential charging of the storekeeper could have been avoided had basic safety precautions been employed. Evidently, the plastic caps which come with these batteries are easily misplaced. We are looking for a solution. Incidentally, melted brass does quite a job on plexiglass desk tops.

LCDR E. J. Lischke, USN
ASO HS-15

● The picture is worth 10,000 words! Sounds like "The Case of the Crosseyed Navel."

Professional Aviator or Just a Pilot

North Kingstown, R.I. – Not being a military-type pilot, but rather a civilian, professional-type, I am a little confused

by a statement made in the December '72 issue of APPROACH. (A fine magazine that is read from cover to cover before it leaves my desk.) I refer to the article on page 35, "Professional Aviator or Just a Pilot."

"In case you think we're blowing smoke, there were three instances within a 2-week period last quarter when pilots under the same circumstance, a waveoff, rammed the throttles to the firewall *before increasing prop pitch*. All three involved aircraft with copilots (two had flight engineers)."

I was always under the impression that one should decrease prop pitch (increase RPM) prior to ramming throttles to the firewall. As a Navy Aero Club flight instructor and a NAVAIRREWORKFAC Aircraft Mechanic Instructor, I am fully aware of the confusion that always exists in this area.

I would appreciate clarification on the statement in question.

Victor Apicerno

• Boy, did we ever fall on our sword! The dude who wrote the article said philosophically, "That's the second time I made the same mistake. The first time was '41." You'd think a guy would learn from his mistakes.

He'd have been home free if he'd said "increase RPM" or "prop levers to low pitch." As it was, he really stepped on it.

Thanks for writing, and watch your prop pitch on waveoffs.

Damned If You Do and Damned If You Don't

NAS, Unknown – The November 1972 APPROACH was a great issue. I have noticed that Letters to the Editor often provides as much insight and information into Fleet happenings as your well-illustrated and documented feature articles.

I'm a cover to cover APPROACH fan . . . and as a veteran of 5000 airborne pilot hours, I'd like to add my concern about an untenable situation: the boss ordering his pilots to toss NATOPS overboard for the sake of convenience (see "Passengers *sans* Seats," November APPROACH Letters to the Editor).

As a conscientious aircraft commander, I shudder because I know that many commanders really don't understand why the pilot is reluctant (as is my personal experience), nor do they care. Your comment that the pilot's position is between a rock and a hard place really should read, "you're damned if you do and damned if you don't." The word is grim . . . the alternatives at stake are your career or your life.

I've been lucky, not skillful, in avoiding hardheaded commanders. I venture to say that there are more than a few pilots who bought the farm knowing they were being pushed toward that hard place.

Shuddermouse

• You're right, the word is "grim." We do believe, however, that you are somewhat pessimistic about the number of commanders who put the pilot "between a rock and a hard place." It's our belief – and experience – that most commanders fully support NATOPS/SOP and have the utmost concern for their pilots. ◄

FLIP Changes

THE DEFENSE Mapping Agency, St. Louis, Missouri, has notified the Naval Safety Center of the following changes to FLIP documents:

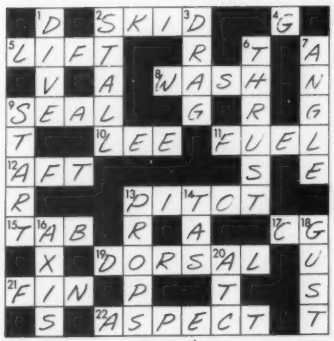
• *Civil SID Books.* Effective with the 1 March 1973 issue, and extending for an indefinite period, Civil SIDs for the Western United States will be separated into two volumes. The area of coverage for each volume will be shown on the back cover. Civil SIDs for the Eastern United States will continue to be published in one volume.

• *New FLIP Features.* The 4 January 1973 issue of the Pacific and South Asia FLIP Enroute package contains the last issue of H-1/H-2 chart. The bulk of aeronautical information contained on this chart is duplicated now on the "all altitude" charts. Therefore, required high altitude information will be added to the "all altitude" charts using distinctive symbology. Consult the Enroute Chart legend.

The last issue of the Tactical Aerodrome Directory, South Vietnam, will be dated 1 February 1973. Recipients who retain the 1 Feb issue for future reference should reconfirm published information prior to use.

• *Worldwide Realignment of DOD FLIPs.* Phase II of the DOD FLIP realignment program has been completed for the Pacific Area. Enroute and Terminal IAP product area names were changed to Pacific and South Asia vice Pacific and Southeast Asia, to better describe and include the area covered by Charts 9-10 which were transferred from the ASWA FLIP package. The numbers of charts 7-8 were reversed to improve chart number continuity in a west-to-east sequence. The new Chart 8 and 9-10 were realigned slightly to minimize chart overlap and increase total area of coverage. Chart 1 received a major realignment to better encompass the additional area of coverage represented by charts 9-10.

Answers to Crossword Puzzle



Courtesy Florida Aviation Safety Bulletin

Vol. 18 **approach** No. 10

RADM W. S. Nelson
Commander, Naval Safety Center
Publisher

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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Cover: North American Rockwell's artist Dwight Greenwalt depicts a section of T-2Bs passing astern LEXINGTON (CVT-16).

DENIAL

By CPO R. A. LaMarche
Survival Training Department
FASOTRAGRUPAC

HEY! John Q. Pilot, Lieutenant, USN, we both know you aren't going out of your F-4 at 30,000 over "Indian country" – but your wingman might. Of course, he'd never admit it either.

This is good. It's necessary. We call this the "denial factor." It's the something extra that enables the naval aviator to strap on a high-performance aircraft, get shot from a carrier deck, fly hundreds of miles, and return to be "hooked" by his postage stamp home – many times in the dark of night.

What if he doesn't come back to get hooked?

Your buddy will probably be wet and cold or in hiding – in a survival situation with all of the accompanying shock, fear, and pain.

What's he going to do now? Think back, Pensacola . . . DWEST . . . SERE . . . JEST . . . squadron survival lectures – all that training you guys were forced to attend. Well, with all that, he should be in pretty good shape to help himself get rescued; besides, he's a pretty level-headed guy, right?

In any survival situation, the most logical thinking person in the world can become the most illogical survivor. This is the reason for repetition in your training. It helps overcome the denial factor and gives you and your wingman the material to form a game plan for survival.

Remember how you had to nudge your buddy awake during the survival radio lecture at DWEST? Hope he remembered enough to operate that radio at night without light; it's starting to get dark out. Did he remember to replace his flares after that pyrotechnic demo last month?

Oh, yes! Didn't you and your buddy have the PRs repack your survival vests 3 months ago? So you know what you have and where it is – now?

I wonder what LCDR Bailout did during his survival incident last year? Might be interesting to talk to him and find out. His experiences might teach us all a few things. Matter of fact, why not invite him to tell his story to all the aviators in the readyroom.

There it is! Just got word they recovered your buddy from the water. He's in fine shape. Everything went by the book. Think maybe we ought to go talk to him about how he survived – see if his game plan worked, and find out what troubles he encountered? Might want to talk to the rescue people, too.

Now – how about you!

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